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MAMMALS COLLECTED IN KAZAKSTAN, CENTRAL ASIA, BY THE MORDEN-GRAVES NORTH ASIATIC EXPEDITION, WITH THE DESCRIPTION OF A NEW GROUND SQUIRREL

By G. G. GOODWIN

The trip undertaken by the Morden-Graves Expedition in Central Asia during the fall of 1929 was made primarily for a group of saiga for the North Asiatic Hall of The American Museum of Natural History.

Leaving the Orenburg and Tashkent Railway at Kizil Orda (marked on most maps Perovsk) on October 7, 1929, we traveled northeast, at first through flat areas where water was plentiful and reedy ponds and small lakes were scattered, and later through alternate arid steppe country and dry, sandy desert areas. During the first day we crossed a small but fairly swift river, which I understood to be a confluent of the Syr Darya, then north to Tele Kul, a chain of shallow, flat, mud lakes, where water fowl were abundant and golden eagles and small flocks of sand grouse were frequently seen in the surrounding steppes. After a few days were spent collecting here, we moved north through typical steppe country, vast, arid, flat plains, with little vegetation and stretches glistening white with caked salt, to an escarpment at Tuz Bulak, about one hundred and fifty miles north of Kizil Orda. Gerund (*Gazella subgutturosa*) were frequently seen in small bands of five or six on the open steppes. Most of the small mammals collected were secured here. The expedition then traveled about one hundred miles north toward the Sari-Su, where saiga were eventually secured by Mr. Morden.

Acknowledgment is due to Mr. William J. Morden and the late Mr. George C. Graves, 2d, who organized and led the expedition and assisted me in collecting the small mammals.

***Hemiechinus calligoni turkestanicus* Ognev**

Turkestan Long-eared Hedgehog

Hemiechinus calligoni turkestanicus OGNEV, 1928, 'Mammals of Eastern Europe and Northern Asia,' I, p. 130.

Two specimens: Tuz Bulak, one hundred and fifty miles north of Kizil Orda (Perovsk), Kazakstan, 600 feet elevation.

A small long-eared hedgehog with white under parts, dark face, proportionally short spines; relatively narrow rostrum and narrow interorbital space; similar in color to *H. c. calligoni*, but the skull is a little more elongate and rostrum narrower; tooth rows longer than in the typical form.

Color of two subadult specimens from Tuz Bulak, taken in October, 1929: spines creamy white with a blackish-brown base and broad blackish-brown ring near the short white tip; crown of head and cheeks tawny olive,¹ this color extending backward below ears to back and in a narrow lateral line on the margin which separates the spiny surface from the fur; muzzle, from eyes to end of snout, blackish brown; ears sparsely covered with creamy-white hairs; upper surface of fore and hind feet sepia; tail sparsely covered with stiff dusky hairs; entire under parts, including lower lip, chin, and fore and hind limbs to ankles creamy white.

Measurements: total length from nose to end of tail, 180, 150 mm.; tail vertebrae, 15, 17 mm.; hind foot with claws, 35, 39 mm. (36 mm. in the dried skin); ear from notch, in dried skin, 32, 30 mm. Skull: condylobasal length, 43.5, 43 mm.; basal length, 40.5, 40.2 mm.; length of nasals, 15.2, 14 mm.; greatest width of nasals, 3.2, 3.5 mm.; zygomatic breadth, 24.5, 24.3 mm.; interorbital constriction, 12.6, 12 mm.; postorbital constriction, 11.1, 12 mm.; greatest outside width across molars, 16.7, 16.7 mm.; length of upper tooth row, 23, 23.2 mm.

The present specimens were taken in a dry, narrow ditch at the foot of an escarpment about one hundred and fifty miles north of the type locality for *H. c. turkestanicus*. Measurements and characters of the Tuz Bulak specimens agree closely with the figures and type description given by Ognev. The spines in our specimens, however, are much shorter (18 mm.) and more slender than in the type series (21.5 mm.). Lack of material has prevented me from comparing these specimens with any of the central Asiatic species of small hedgehogs; from *H. a. minor* it apparently differs in smaller size and narrower rostrum, and from *H. russoni* in its longer ears and darker color.

***Crocidura suaveolens mordeni* Goodwin**

Morden White-toothed Shrew

Crocidura suaveolens mordeni GOODWIN, 1934, Amer. Mus. Novit., No. 742.

Nine specimens: Tuz Bulak, 7; Tele Kul, 2.

A small pale-colored white-toothed shrew about the size and general proportions of *C. lignicolor* Miller, but color paler, under parts nearly pure

¹Color Standards and Nomenclature, Ridgway.

white, this color extending well up over sides of body and face; tail relatively long, distinctly bicolor, the line of demarcation sharply indicated; pelage moderately long and soft.

Color of type specimen from Tuz Bulak: upper parts, including upper surface of tail, uniform, between Verona brown and wood-brown; fore and hind limbs, feet, lips, cheeks to eye, base of ear, and entire under parts, white, lightly washed with pale buff. The dorsal area in the six paratypes varies in color from Verona brown to pale wood-brown, but under parts throughout the series are white.

Skull about the size and general proportions of *C. lignicolor*; the length of the upper tooth row averages slightly longer than in typical specimens from Djarkent, eastern Turkestan, but general characters are essentially the same.

Measurements of type and average of five paratypes (taken in the flesh): total length, 90, 90.4 mm. (87–95); length of tail vertebrae, 30, 30.8 mm. (30–32); hind foot, including claws, 12.5, 12.3 mm. (12–12.5). Skull: condylobasal length, 16.8, 17.2 mm. (16.7–18.5); least interorbital breadth, 4, 4 mm. (3.8–4.3); greatest breadth of brain case, 8.2, 8.3 mm. (8.1–8.7); length of entire maxillary tooth row, 7.9, 8.1 mm. (7.8–8.2).

C. s. mordeni can readily be distinguished from *C. lignicolor* by its white under parts and more sharply bicolor tail. I have not compared it with *C. ilensis* Miller from Ili, but from the type description it differs in color, smaller feet, and some cranial characters. The type and six paratypes were taken in the open steppe country and in narrow ditches at the foot of an escarpment where the water from springs trickled down and dried up on the desert. Two specimens were taken at Tele Kul, sea level, in the flat alkali lake district.

Purtorius eversmanni (Lesson)

Steppe Polecat

Mustela Eversmanni LESSON, 1827, 'Manuel de Mammalogie ou Histoire Naturelle des Mammifères,' Paris, p. 144.

One specimen: adult female, from Kal-gach, two hundred and fifty miles north of Kizil Orda (Perovsk), Kazakstan.

A small soiled whitish animal, with a long body and short black limbs.

Color of specimen from Kal-gach, taken October 28, 1929: fur creamy white washed with long black-tipped guard hairs; head creamy white with a broad blackish-brown band across the face and eyes and

almost to corner of mouth; fore and hind limbs and feet, under side of neck and breast, black; an indistinct blackish-brown patch of hairs in front of ear; distal half of tail black.

Measurements of adult female (taken in the flesh): total length, 423 mm.; tail vertebrae, 115 mm.; hind foot, 40 mm. Skull: condylobasal length, 55.6 mm.; zygomatic breadth, 32 mm.; interorbital constriction, 14.8 mm.; distance from front of canine to back of last molar, 18.4 mm.

The present specimen was found ambling along on the open steppe country.

Vulpes vulpes karagan (Erxleben)

Karagan Fox

Canis Karagan PALLAS, 1771, 'Reise durch verschiedene Provinzen des Russischen Reichs,' I, pp. 200, 234.

One specimen: two hundred miles north of Kizil Orda (Perovsk), Kazakstan; purchased alive from the natives, apparently a pet animal.

The Karagan fox is a moderately large pale-colored form with a comparatively long tail and coarse loose fur.

Color of an adult female specimen from the Kirghiz Steppes, killed October 28, 1929: fur on back rich ochraceous tawny mixed with light buff-tipped guard hairs; crown of head, middle of neck, base of ears and shoulders clear bright ochraceous buff; sides of neck and body warm buff; tip of ears broadly black; end of muzzle and upper lip white, lower lip white, but with a narrow margin of dark gray; front of hind legs bright ochraceous tawny with a small spot of black-tipped hairs at base of toes; front of fore legs with a rather broad stripe of light buff hairs tipped with black; tail pale light buff with a mixture of black-tipped hairs, tip of tail white; inguinal region white; throat and a narrow stripe on middle of belly plumbeous washed with soiled whitish.

The skull is moderately large, facial region narrow, brain case short, teeth rather weak.

Measurements of adult female: total length, 1005 mm.; tail vertebrae, 370 mm.; hind foot, 150 mm. Skull: greatest length, 139.5 mm.; condylobasal length, 135 mm.; zygomatic breadth, 71 mm.; breadth of brain case, 46 mm.; greatest outside breadth across molars, 41.75 mm.; length of nasals, 53 mm.; length of upper tooth row from front of canine to back of last molar, 64 mm.

The Karagan fox apparently inhabits the low subdesert country of the Kirghiz Steppes. I saw tracks of several foxes in the sand on an

escarpment at Tuz Bulak; it is frequently taken young by the Kirghiz and kept as a pet, and a native caravan is hardly complete without a fox riding on the back of a camel.

Citellus pygmaeus kazakstanicus, new subspecies

TYPE.—No. 85310, Amer. Mus. Nat. Hist.; male adult; Tuz Bulak, one hundred and fifty miles north of Kizil Orda (Perovsk), Kazakstan, Central Asia, altitude 600 feet; October 17, 1929; collector, George G. Goodwin. The type is a skin in good condition and skull with brain case and occiput broken.

GENERAL CHARACTERS.—A small pale-colored ground squirrel with a unicolor tail which is less than one quarter the length of head and body.

DESCRIPTION.—Color of type specimen from Tuz Bulak: upper parts warm buff, darkest on mid-dorsal area, with insignificant pied markings caused by dusky and pale yellow rings around each hair; crown of head bright ochraceous buff; sides of body, fore and hind limbs, feet, lower part of cheeks between warm buff and light buff, a light buffy ring around eyes; tail deep warm buff; under parts light buff, the plumbeous basal color showing through. Cranial characters about as in typical *C. p. pygmaeus*.

MEASUREMENTS (taken in the flesh).—Total length, 190 mm.; tail vertebrae, 35 mm.; hind foot, including claws, 33 mm. Skull: zygomatic breadth, 26 mm.; interorbital breadth, 7 mm.; length of nasals, 13 mm.; alveolar length of upper molar tooth row, 9.5 mm.

Skin of *C. pygmaeus kazakstanicus*, compared with typical *C. p. pygmaeus* from the lower Volga region, is much paler in color. *C. p. herbicola* Martino from northern Kazakstan, its nearest geographical subspecies, is even darker than the typical form. I have not compared the present specimen with *C. p. brevicauda* Brandt from the Zaisan River, but it is, apparently, much paler and less reddish in color.

This specimen was taken in a scanty growth of low sagebrush in the open steppe country. Apparently most of its kind had already hibernated for the winter as I found plenty of ground squirrel holes, but extensive trapping yielded no further specimens.

Allactaga elater elater (Lichenstein)

Kirghiz Steppes Big-eared Jerboa

Dipus elater LICHENSTEIN, 1825, 'Über du Springnäuse,' Abh. d. Berlin Akad. d. Wiss., p. 155.

Five specimens: Tuz Bulak, one hundred and fifty miles north of Kizil Orda (Perovsk), Kirghiz Steppes, Kazakstan, 4 skins and skulls, 1 alcoholic.

A medium-sized jerboa with large ears, long tail and large hind feet. Color of specimens from Tuz Bulak, taken in October, 1929: upper

parts, including crown of head, warm buff, tips of fur washed with blackish brown, heaviest on mid-dorsal area and rump; base of fur plumbeous; side of body, face, outside of hind limbs and shoulders slightly paler buff than back and lightly washed with blackish, base of fur white; a broad stripe of pure white hairs across hips meeting white of belly below tail; a patch of black hairs below white stripe on posterior outside of hind limbs; outside of ears warm buff, inside sparsely covered with soiled whitish hairs, inside rim warm buff; under parts, including fore limbs, feet, inner side of hind limbs and upper side of hind feet, toes and cheeks white to base of fur; under side of hind feet sparsely covered with brownish-black hairs, below, clear warm buff grading to light buff posteriorly; brush, subterminal area black for 31.5 mm., preceded by a narrow band of light buff, tip pure white, the black area meeting on midventral line in most specimens but divided by a white line in others. Skull: upper premolar much reduced; present upper incisors protruding but not grooved; interorbital constriction relatively broad; tympanic bullae not extensively inflated; incisive foramina extending backward not farther than the anterior border of first molar.

Measurements of one adult male and two adult females from Tuz Bulak: total length, 260, 265, 255 mm.; tail vertebrae, 160, 163, 155 mm.; hind foot, 56, 57, 53 mm.; ear from notch, in dried skin, 25.3, 25, 25 mm. Skull: condylobasal length, 25.3, 24.9 mm.; zygomatic breadth, 19.5, 20.1, 19.5 mm.; length of nasals, 9.2, 9.2, 8.8 mm.; interorbital constriction, 8.5, 9.5, 9.2 mm.; alveolar length of upper tooth row, 5.0, 5.05, 4.9 mm.

The five specimens were taken at about 600 feet elevation in small areas of sagebrush in the flat, sparsely grassed steppe country. Its habits appear to be much the same as those of *A. acontion* though it possibly inhabits a somewhat higher plain and more fertile country than *A. acontion*. *A. elater* was originally described from the Kirghiz Steppes and the present series is probably typical.

***Alactagulus acontion acontion* (Pallas)**

Kirghiz Steppes Little Jerboa

Dipus acontion PALLAS, 1811, 'Zoographia Rosso-Asiatica,' Tome I, p. 182.

Three specimens: Tele Kul, seventy-five miles northeast of Kizil Orda (Perovsk), Kazakstan.

A rather small pale-colored jerboa with moderately large ears, long tail and well-developed hind limbs.

Color of specimens from Tele Kul, taken in October, 1929: upper

parts, including ears, crown of head and outer side of hind limbs light buff, tips of fur blackish brown, base of fur plumbeous, clear light buff on head and ears; sides of body paler than back, base of fur white, a stripe of pure white hairs across hips; under parts, including fore limbs and fore feet, inner side of hind limbs and hind feet white to base of fur; tail above, warm buff mixed with brownish-black fur on basal two-thirds; subterminal area of brush black for 17 mm., preceded by a band of light buff, tip white, under side of tail to brush warm buff, the black area almost but not quite meeting in a narrow band on midventral line. Cranial characters: tympanic bullae not extensively inflated and not in contact with each other; upper incisors protruding forward and not grooved; upper premolar absent; anterior end of nasals not reaching the level of alveoli of upper incisors.

Measurements of one adult male and two semiadult males from Tele Kul: total length, 245, 220, 205 mm.; tail vertebrae, 135, 135, 120 mm.; hind foot, 47, 47, 45 mm.; length of ear from notch, in dried skins, 21, 20.5, 20.5 mm. Skull: condylobasal length, 24.8, 23, 21.5 mm.; zygomatic breadth, 21.4, 20.2, 18.6 mm.; length of nasal, 10, 8, 8 mm.; alveolar length of upper tooth row, 5, 4.8, 4.6 mm.; interorbital constriction, 8.3, 7.9, 7.5 mm.

The present three specimens were taken at sea level in the low sagebrush on a flat, sandy, alkali plain at Tele Kul, Kirghiz Steppes. The traps were set at the top of burrows and the specimens were taken during the night; the temperature at the time ranged from 30 to 32° Fahrenheit.

Mus musculus wagneri Eversmann

Wagner Mouse

Mus Wagneri EVERSMANN, 1848, Bull. Soc. Nat. Moscou, XXI, part 1, p. 191, Tab. 1, fig. 2.

Twenty-six specimens: Tuz Bulak, one hundred and fifty miles north of Kizil Orda (Perovsk), Kazakstan, 11 skins and skulls, 5 alcoholic specimens; Tele Kul, seventy-five miles northeast of Kizil Orda, 7 skins and skulls, 3 alcoholic specimens.

A small buff-colored mouse with a relatively long tail, similar to the common house mouse but smaller in size and much lighter in color.

Color in the present large series shows very little individual variation: upper parts pinkish buff washed with blackish-tipped hairs; sides of head and body slightly paler than back, this color extending down the upper sides of fore and hind limbs to ankles; fore and hind feet white; tail indistinctly bicolor, sparsely covered with short stiff hairs, dusky

above, whitish below; entire under parts white, base of the fur irregularly plumbeous.

Skull small and weak, the anterior palatine foramina extending posteriorly to about the middle of first molar.

Measurements, average of five largest specimens from Tuz Bulak: total length, 135 mm. (133–145); tail vertebrae, 60 mm. (54–65); hind foot, 17 mm. (16.5–18.5). Skull: condylobasal length, 20 mm. (19.5–20.5); zygomatic breadth, 11.1 mm. (10.8–11.5); interorbital constriction, 3.4 mm. (3.4–3.4); alveolar length of upper molar series, 3.4 mm. (3.3–3.5).

The Wagner mouse is an inhabitant of the Kirghiz Steppes. It is common throughout Turkestan and is found in the cultivated districts and on the grassy steppes from sea level to about 4000 feet elevation.

Cricetulus migratorius migratorius (Pallas)

Pallas Hamster

Mus migratorius PALLAS, 1773, 'Reise durch verschiedene Provinzen des Russischen Reichs,' II, p. 703.

Four specimens: Tuz Bulak, one hundred and fifty miles north of Kizil Orda (Perovsk), Kazakstan, 3 skins and skulls, 1 alcoholic specimen.

The Pallas hamster is a pale-colored vole, without a dark mid-dorsal stripe or markings on the head; under side of fore and hind feet partly covered with hair; tail short, unicolor; under parts white.

Color of specimens from Tuz Bulak: upper parts, including crown of head to end of nose and below eyes, light buff lightly washed with blackish brown-tipped hairs, this color extending down outside of hind limbs nearly to ankles; under parts, including fore and hind feet, fore limbs and inner side of hind limbs, and tail, are white, this color extending well up on shoulders and sides of paw; ears with indistinct buffy white border, outside of ears blackish brown, inside light buff; immature specimens darker and grayer than adults; mammae, eight.

Measurements of adult male and female, respectively, from Kizil Orda: total length, 128, 120 mm.; tail vertebrae, 24, 20 mm.; hind foot with claw, 17, 17 mm. Skull: condylobasal length, 25.5, 27.2 mm.; zygomatic breadth, 14.2, 14 mm.; least interorbital constriction, 4, 4 mm.; length of nasals, 10, 10 mm.; alveolar length of upper molar series, 4.2, 4 mm.

This hamster was taken on a dry, sandy escarpment at an elevation of 600 feet; it lived in holes in the ground or under rocks in open arid country where there was little or no cover.

The hamsters of Central Asia are not very well known. I have referred the present series to the above species. It agrees in measurements and general characters with Pallas' description, but differs appreciably from *C. accedula* Pallas of which it has been considered a synonym.

***Microtus (Phaiomys) gravesi* Goodwin**

Graves' Vole

Microtus gravesi GOODWIN, 1934, Amer. Mus. Novit., No. 742.

Five specimens: Tuz Bulak, 4 skins and skulls, 1 alcoholic.

A small light-colored vole with a short tail, ears small but not concealed in the fur; bullae much inflated; externally very similar to *Phaiomys blythi* from Ladak, India, but smaller with relatively shorter tail; smaller feet and widely different cranial characters. Fur long and soft, under side of feet moderately overgrown with hair, but toes and foot-pads naked. Last upper molar with four well-developed projecting angles on inner side. *M. gravesi* is probably an aberrant form of *Phaiomys*.

Color of four specimens from Tuz Bulak uniform: upper parts, hair pinkish buff subterminally, tips dark brown, darkest on posterior dorsal area; fore and hind feet buffy white; tail indistinctly bicolor, light buff with a weak middle dusky stripe along the dorsal surface; under parts light buff, the plumbeous basal color showing through.

Skull angular and broad, with two low, distinct bow-shaped middle or lateral crests; audital bullae large, their walls strengthened by dense spongy bone tissue, inflated, and forming prominences on the sides of the occiput; interorbital area narrow, expanding abruptly posteriorly; the last upper molar with four well-developed projecting angles on inner side. The dorsal surface of the skull resembles Vinogradov's figure of *Phaiomys bucharensis* in his 'Key to the Rodents of Middle Asia,' but differs in having four well-developed projecting angles on inner side of last upper molar instead of three as designated for *Phaiomys* by Dr. Vinogradov.

Measurements of type and average of three paratypes: total length, 120, 117 mm. (113-120); length of tail vertebrae, 25, 22 mm. (20-25); hind foot, including claws, 18, 17.6 mm. (17-18). Skull: condylobasal length, 26, 26.1 mm. (25.8); zygomatic breadth, 15.5, 15.2 mm. (15-15.3); least interorbital breadth, 3.4, 3.7 mm. (3.5-3.8); mastoid breadth, taken just behind the auditory meatus, 12.6, 12.5 mm. (12.5-12.5); length of nasals, 7.5, 7 mm. (7.7); alveolar length of upper molar series, 6.2, 6 mm. (6.6).

This vole was taken in scattered clumps of grass near small springs that trickled down the side of an escarpment and dried up on the sand. It was active at most hours of the day and lived in holes or burrows in the ground and fed on the succulent bases of the grasses. Apparently it is rather local and not abundant. It was difficult to trap, and two of the five specimens I caught with my hands.

***Meriones tamaricinus jaxartensis* (Ogneff-Heptner)**

Aral Sea Jerboa

Gerbillis tamaricinus jaxartensis OGNEFF-HEPTNER, 1928, Zool. Anzeiger, LXXV, No. 11-12, p. 264.

Six specimens: Tuz Bulak, one hundred and fifty miles north of Kizil Orda (Pervosk), Kazakstan, 4; Tele Kul, seventy-five miles northeast of Kizil Orda, 2.

The Aral Sea jerboa is a large rich buff-colored form with a white spot over eyes, under parts white to base of fur, lighter colored than typical *M. tamaricinus* from the mouth of the Ural and less pinkish than *M. t. rokkandicus* from the Ferghana district.

Color of specimens from Tuz Bulak: upper parts, including crown of head and upper side of hind limbs, cinnamon buff, tips of hair bister-black, darkest on rumps; specimens from Tele Kul darker, about clay color; sides of body, upper side of fore limbs and side of head pinkish buff, blackish tips of hair less pronounced than on back; outer side of ear about color of back, margin indistinctly whitish, a small tuft of white hairs at posterior base of ear; a large white spot above eye to base of ear, an indistinct narrow black ring around eye; under part, including upper side of fore and hind feet, under side of fore and hind limbs, lips, chin, and well up on sides of cheeks, belly, white or creamy white to base of fur; under side of fore feet naked; ankles and under side of hind feet from heel to base of toes blackish; under side of hind toes more or less naked; tail above cinnamon-buff heavily mixed with bister, almost black, sides of tail cinnamon-buff, under side of tail light buff or warm buff, cinnamon-buff at base; tip bister, almost black, grading into color of tail above; claws pale brownish, tips white, in some specimens fore claws all white.

Skull: bullae well rounded but not excessively inflated. Anterior palatine foramina not extending posteriorly to line of anterior border of first molars, anterior face of upper incisor ochraceous orange with one groove.

Measurements of two adult males from Tuz Bulak and one subadult male from Tele Kul, respectively: total length, 300, 285, 250 mm.; tail

vertebrae, 130, 145, 120 mm.; hind foot, 40, 41, 37 mm. Skull: one adult male from Tuz Bulak and one subadult male from Tele Kul, greatest length (from tip of nasals to occipital plane), 42.3, 40.4 mm.; condylobasal length, 38, 36 mm.; zygomatic breadth, 23.5, 21.5 mm.; interorbital constriction, 7.2, 7.2 mm.; length of nasals, 17, 17 mm.; length of anterior palatine foramina, 75, 7 mm.; length of upper molar series, 6.5, 6 mm.

M. t. jaxartensis is described as sandy red, distinctly lighter in color than typical *M. tamaricinus*. No measurements were given. The type locality is Kara Usiak on the Orenburg and Tashkent Railroad, not more than one hundred and fifty miles from the locality of the present series.

Four of our specimens were taken in the sand dunes on an escarpment at Tuz Bulak, 600 feet elevation, and are a uniform light-colored series. A subadult male from Tele Kul, sea level, taken in the tall reeds at the side of an alkali lake, is somewhat darker and richer colored with a shorter tail than the Tuz Bulak series. Cranial characters are also somewhat different, the skull being lighter with weaker teeth. These differences, however, I am inclined to consider as individual or local variations and to refer the whole series to *M. t. jaxartensis* for the present.

Pallasiomys meridianus massagetus Heptner

Aral Sea Yellow-tailed Jerboa

Pallasiomys meridianus massagetus HEPTNER, 1933 (December 20), Zeitschrift f. Säugetierkunde, VIII, part 3, p. 155.

One specimen: Tuz Bulak, one hundred and fifty miles north of Kizil Orda (Perovsk), Kazakstan.

A small sandy-colored jerboa with a light yellowish tail; fur on entire under parts and feet white to base of hairs; claws white, thumb small with vestigial claws.

Skull with bullae extensively inflated, upper incisors with one groove on anterior surface.

Color of one specimen from Tuz Bulak: upper parts, including crown of head to nose, cinnamon-buff, mixed with black-tipped hairs; ear about color of back, sides of body, head, pinkish buff lightly washed with black-tipped hairs, an indistinct whitish spot above eye; upper side of hind limbs to ankles nearly clear pinkish buff; entire under parts, including upper and under side of fore limbs and feet, under side of hind limbs and upper and under side of hind feet, lips, chin, and well up on cheeks are white to base of fur; tail above bright clay color mixed with a few scattered black-tipped hairs; under side light buff divided by a mid-

vertical line of cinnamon-buff; pads of fore feet naked; fingers and entire under side of hind feet hairy; claws white; upper incisors zinc-orange. Skull: bullae extensively inflated but relatively small for *M. meridianus*; anterior palatine foramina extends posteriorly to a line across anterior border of alveoli of first molars.

Measurements (taken in the flesh): total length, 200 mm.; tail vertebrae, 100 mm.; hind foot, including claws, 30 mm. Skull: greatest length from nasals to occipital plane, 31 mm.; condylobasal length, 27 mm.; basal length, 25.2 mm.; length of nasals, 12 mm.; length of anterior palatine foramina, 5.5 mm.; greatest breadth across bullae, 17.1 mm.; interorbital constriction, 6 mm.; alveolar length of upper molar series, 4.2 mm.

This specimen was taken in a sparse growth of low sagebrush in the open flat steppe country.

Pallasiomys erythrourus eversmanni (Bogdanov)

Eversmann Jerboa

Meriones eversmanni BOGDANOV, 1875, Travaux Soc. Nat. de St. Petersbourg, VI, p. 266.

Twenty-four specimens: Tuz Bulak, one hundred and fifty miles north of Kizil Orda (Perovsk), Kazakstan, 1 alcoholic, 23 skins and skulls.

The Eversmann jerboa is a medium-sized sandy-colored species with color of fur at the base plumbeous. Skull with large bullae, narrow rostrum, and one groove on anterior face of upper incisor.

Color of specimens from Tuz Bulak: upper parts, including crown of head to nose, cinnamon-buff; tips of fur blackish, plumbeous at base and sparsely mixed with a few black hairs; sides of head and body slightly paler than back, about warm buff mixed with black-tipped hairs; upper side of fore and hind limbs to ankles and an indistinct lateral line pinkish warm buff; upper side of hind feet pale light-buff with an irregular line of warm buff down outer side, sometimes spreading over entire surface and absent in others; an indistinct buffy patch behind eye in some specimens; a light buffy spot at posterior base of ear, outside of ear about color of back, inside light buff; a clear cinnamon-buff patch at base of whiskers; whiskers, upper half black, lower half white; basic color of tail uniform, between clay color and ochraceous buff mixed with black-tipped hairs, clear below at base and sides for about half its length, tip black, which color extends along upper side for 50 mm., gradually blending with rest of tail; under part of body, including belly to throat and under side of hind limbs, creamy white, base of fur plumbeous;

lips, throat, under side of fore limbs white to base of fur; soles of fore feet and toes naked; under side of hind feet and toes hairy, except parts on toes and heels to center of foot hairless; nails on fore and hind feet blackish brown, tips white.

Skull: bullae large and inflated, extending well forward and in contact with posterior border of zygomatic arches and backward to occipital plane, spreading outward a little wider than zygomatic breadth; zygomatic arches weak, not angular, and narrower anteriorly than posteriorly; rostrum narrow elongate with relatively long narrow nasals; anterior palatine foramina long, extending posteriorly to anterior border of first molar; posterior palatine foramina normal; upper incisors orange-buff with one groove on anterior surface.

Measurements, average of five largest adult males and females from Tuz Bulak: total length, 277 mm. (270–280); tail vertebrae, 139 mm. (135–140); hind foot, 35.4 mm. (35–36). Skull: greatest length from tip of nasal to occipital condyle, 38.7 mm. (38.2–39.5); condylobasal length, 34.3 mm. (33.7–35.3); zygomatic breadth, 20.8 mm. (20.5–21.2); greatest breadth across bullae, 21.2 mm. (21–21.7); interorbital constriction, 6.7 mm. (6.5–7); length of nasals, 14.5 mm. (14–15); length of anterior palatine foramina, 6 mm. (5.7–6.6); length of upper molar series, 5.6 mm. (5.3–5.7).

The Eversmann jerboa was abundant locally in the arid steppe country north of Kizil Orda. The present series were taken at the base of a low escarpment at Tuz Bulak, where the dry, sandy soil was packed hard and the scant vegetation consisted of clumps of low sagebrush and a scattered growth of coarse grass. It apparently lived in small colonies, the burrows occupying an area about ten feet in diameter with about twelve holes in the colony. It was active during most of the day and frequently was seen about in the bright sunlight in the early afternoon. In the distance it appeared to amble along in much the same way as the common house rat, and at the first sign of danger it retreated to the burrow and rarely reappeared on the surface until the following day.

Lepus tolai lehmanni Severtzoff

Turkestan Hare

Lepus Lehmanni SEVERTZOFF, 1876, Ann. Mag. Nat. Hist., (4) XVIII, p. 169.

Two specimens: Tuz Bulak, one hundred and fifty miles north of Kizil Orda (Perovsk), Kazakstan.

A small pale-colored hare with tail broadly blackish on upper side. Skull relatively long and slender with narrow palate.

Color of two specimens from Tuz Bulak, taken on October 15 and 22: upper parts about smoke-gray; the hairs with a broad band of light buff, tipped with smoke-gray on flanks and hips and more blackish on mid-dorsal area and crown of head; shoulder and sides of head more buffy; ears in front evenly mixed buff and black with a creamy white border in front and a narrow black edge on terminal half of back, expanding at tip, posterior border and inside of ears light buff; tail white, with a broad black band on dorsal surface; upper side of fore and hind limbs and feet buff or white; under side of neck and breast to front legs buff mixed with gray; under parts, including under side of fore and hind limbs, throat, and chin, white. Summer pelage duller and browner, the buffy band on the hairs darker and the black tips less pronounced.

Measurements of two adult males: total length, 510, 545 mm.; tail vertebrae, 111, 90 mm.; hind foot, 125, 120 mm.; ear from notch, in dried skin, 80 mm. Skull: greatest length, 83, 82.5 mm.; zygomatic breadth, 41, 40 mm.; interorbital breadth in front of supraorbital process, 16, 15 mm.; behind supraorbital process, 12, 12.5 mm.; width of palate outside molars, 13.5, 13.3 mm.; length of nasals, 34.9, 33.9 mm.; alveolar length of upper molar series, 16, 15 mm.

This is a well-marked subspecies, characterized by its peculiar color and narrow skull. I found it not uncommon in the low sagebrush areas on the steppes of Kazakstan.

Saiga tatarica (Linnaeus)

Saiga

Capra tatarica LINNAEUS, 1766, 'Syst. Nat.', I, p. 97.

Six specimens from Kirghiz Steppes, two hundred and fifty miles north of Kizil Orda (Perovsk) Kazakstan, Central Asia, altitude 1500 feet.

The saiga is a rather small, light-colored antelope; adults stand a little over two feet at the shoulders. It is readily distinguished from all other forms of antelope by its large inflated nose.

Color of an adult male taken in October, 1929: upper parts cinnamon-buff shading into pinkish buff on sides of body; nose and sides of face and outside of ears like back, inside of ears buffy white; crown of head from between eyes to neck hairs long and grizzled, nearly white and mixed with a few brownish hairs in front of ears; an irregular patch of short brownish hairs in front of eyes; tail above like back, white below; a white patch on rump around tail broken by a narrow strip of buff from back to tail; fore and hind limbs cinnamon-buff; under parts, including throat, chin, lips, and inner side of fore limbs to knees white; a narrow

strip of rather long dark hairs on mid-dorsal line above rump. An adult female has the whole front of the face and nose soiled whitish and the white of under parts extends in a narrow line down the inner side of fore and hind limbs. The white rump patch is more pronounced and not distinctly broken by a mid-dorsal line. Immature specimens similar to adult, but color a shade paler and with the grizzled patch on crown of head. In winter, pelage is reported to be almost pure white. The series taken in October had moderately long hair, which did not look as though it would be shed that fall.

Only the males have horns, which attain a length of 13 or 14 inches and are a peculiar translucent pale amber color. The horns of the adult male taken by the expedition are 11½ inches long and have a spread of 7½ inches. The weight of this specimen, before cleaning, was 100 pounds and an adult female weighed 80 pounds.

Saiga frequent the dry steppe country and especially the great flats of dried mud, common in the region visited; their food consists mainly of the long shoots that grow from a low sagelike plant and, according to the natives, they also eat a plant that looks like dried moss. Little information concerning their habits could be obtained from the natives; they are seldom seen, in the region visited, in herds that number over five or six, but it is possible that in sections where they are more abundant they travel in larger herds. It is evident that they migrate to some extent with the season, moving from the higher plateaus into the less snowy areas of the steppes in the fall. They move with a shambling, rather sneaking gait and carry their heads down whether at a walk, trot, or gallop, and apparently can easily outrun a horse.

